

Factors leading to poor water sanitation hygiene among primary school going children in Chitungwiza

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Abstract

Although the world has progressed in the area of water and sanitation, more than 2.3 billion people still live without access to sanitation facilities and some are unable to practice basic hygiene. Access to water and basic sanitation has deteriorated in Chitungwiza and children are at risk of developing illness and missing school due to the deterioration. We sought to investigate the predisposing, enabling and reinforcing factors that are causally related to water- and sanitation- related hygiene practices among school going children. A random sample of 400 primary school children (196 males, 204 females) in four schools in Chitungwiza town, Zimbabwe was interviewed. Behavioural factors were assessed through cross examination of the PROCEED PRECEDE Model. The respondents had been stratified through the random sampling where strata were classes. A structured observation checklist was also administered to assess hygiene enabling facilities for each school. Children's knowledge and perceptions were inconsistent with hygienic behaviour. The family institution seemed to play a more important role in life skills training and positive reinforcement compared to the school (50% *vs* 27.3%). There was no association between a child's sex, age and parents' occupation with any of the factors assessed ($P=0.646$). Schools did not provide a hygiene enabling environment as there were no learning materials, policy and resources on hygiene and health. The challenges lay in the provision of hygiene enabling facilities, particularly, the lack of access to sanitation for the maturing girl child and a school curriculum that provides positive reinforcement and practical life skills training approach.

Introduction

Despite the progress made worldwide in recent decades in the area of water and sanitation, more than 2.3 billion people still live with-

out access to sanitation facilities and some are unable to practice basic hygiene.¹ Access to water and basic sanitation has deteriorated in Chitungwiza due to water rationing, burst water and sewer pipes, poor disposal of rubbish and overpopulation.

Improvements in health associated with better water quality are smaller than those obtained through increases in quantity of water, which allow for better personal and domestic hygiene practices.^{2,3} Population groups that consistently use more water have better health than groups that use less water. This has been shown repeatedly for several health outcomes such as specific diarrhoeal pathogens, diarrhoeal morbidity and child growth.^{2,4}

Enhancements in water and sanitation do not automatically result in improvements in health. The addition of hygiene education is required to impart concern on the basic issues of hand washing, proper disposal of faecal matter and protection of drinking water.⁵

Millions of school-going children miss or have ineffective schooling as a result of disease linked to unsafe drinking water and inadequate sanitation. In 2002 more than 500 million school aged children lived in families which did not have access to improved water supply. Sadly most schools may not have adequate sanitation facilities.⁶ Numerous studies have shown that children infected with intestinal worms perform poorly academically. A child severely deprived of shelter, living in an overcrowded home and an impoverished neighbourhood may not be able to absorb an education even if there is a school nearby.⁶

In the developing world girls mostly bear the burden of water collection, which may take them many hours a day, leaving them with less or no time nor energy for school. Secondly, girls, particularly those old enough to menstruate, may be reluctant to attend school.⁷

Children's knowledge, attitudes and beliefs largely depend on what they are taught be it at home or school. In Leeds, UK, many outbreaks of gastrointestinal infections have been associated with primary schools.⁸ In terms of water deprivation, approximately 400 million children, on average one in every 5 children in developing countries; have no access to safe water. The situation is particularly severe in the sub-Saharan Africa. Four out of five children either use surface water or have to walk more than 15 min to find a protected water source. Rates of severe deprivation are considerably higher in rural areas (27%) than to urban areas (70%).⁶

In terms of sanitation deprivation, one in every three children has no access to safe sanitation; again the problem is particularly pronounced in rural areas. Without access to sanitation, children's risk of disease rises dramati-

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ically further jeopardizing their chance of survival and often reducing the likelihood that they will be able to take full advantage of schooling.

School health services have not yet developed in many developing countries. In Zimbabwe, the Ministry of Health and Child Welfare, together with the Ministry of Education, Sports and Culture, have drafted a policy on school health known as The Zimbabwe Comprehensive School Health Policy,⁹ with the main objectives being to promote, protect and support delivery of health instruction, health services and a healthy environment in the school setting.

In Zimbabwe, Moyo, Makoni and Ndamba¹⁰ found that there was a similarity in practices of handling of menstruation in both rural and urban schools in that menstruation was not considered an issue that deserved special attention. There was a lack of adequate ablution facilities and sick bays, and toilets ratios did not meet the government specifications of one squat hole per 15 girls and one per 20 boys. In urban schools there were no incinerators or other suitable disposal facilities and as a result the girls flushed their sanitary pads down the toilet leading to blockages of sewer lines. In most cases, school toilets are not adapted to the special needs of boys and girls.

Materials and Methods

We employed a cross-sectional survey, since we sought to describe the status of hygiene behavior relevant to water and sanitation promotion at one point in time by collecting data from relevant school segments. The targeted population was all children of primary school going age in Chitungwiza. The study popula-

tion consisted of grade seven pupils attending school in Chitungwiza as they were the more mature and most senior in primary schools.

Theoretical framework

The Precede-Proceed model of behaviour determinants provided the framework for the study. According to Green & Kreuter hygiene behaviour can be explicated as a function of the collective influence of several factors as behaviour is a multifaceted phenomenon.^{11,12} The model categorizes factors into three broad categories, namely predisposing, enabling and reinforcing factors (Figure 1).

In light of all this, the following objectives were formulated and tested:

- To identify knowledge, attitudes and beliefs that contribute to poor sanitation promotion in schools
- To determine service factors that negatively impact on water and sanitation promotion in schools
- To assess reinforcing factors leading to poor water and sanitation hygiene

Sampling

A two staged sampling procedure (multi-stage) with random sampling was used. Below are the two stages that were used.

Stage #1

Four schools, one from each district of Chitungwiza were randomly sampled to make a geographical sample. A list of all schools in for the first district was made. Then each school assigned a number. Numbered cards were made for all the primary schools in that district and put in a closed box from which a single card was randomly picked. This exercise was repeated for the other districts resulting in the primary sampling unit.

Stage #2

From each school sampled, a list of grade seven classes was made and randomly selected using the lottery method of randomly picking up cards with the classes listed on each card. The selection took into consideration the total grade seven school enrolments in the four schools and also used the average number of pupils of 30 in each class in all schools. Then the pupils in the selected classes were sampled. The sample size was determined using the Dobson's formula for the sample size of a single population proportion and this yielded at total sample of 384, and we utilized a sample size of 400 to increase the study's precision.

Data collection procedures

A self-administered child friendly questionnaire was the main tool used to collect data. The questionnaire was constructed using constructs from the educational and organization-

al diagnosis in the PRECEDE-PROCEED Model. The questionnaire was back translated into Shona to cater for children who were not fluent in English.

Focus group discussion

A focus group discussion (FGD) was conducted with one class, which was chosen using the lottery method with the classes with children who completed the questionnaire, for each school. The discussion allowed one to explore the range of opinions/views on hygiene. This allowed us to triangulate the results from the two methods used to collect data from the school children i.e. the self-administered questionnaire and the FGD. The findings also helped the researcher to develop categories for coding the responses.

The hygiene enabling facilities in schools were assessed through a structured observation checklist at each school in terms of availability of bins and maintenance of sanitary facilities. The checklist also assessed the use of the policy for school health promotion.

A pretest was done in sequence to assess

content validity so that the objectives of the study were met and to check if the translations and the research instrument were suitable for the targeted study population and the time available to pupils to complete the questionnaire. Data was collected from the four schools in Chitungwiza during the last week of the school semester. The logistics of data collection emphasized on ensuring that all pupils complete questionnaires as a first line quality control check. Once the data was checked for completeness and accuracy, we numbered the questionnaires to give each questionnaire an identity number for easier handling.

Data management and analysis

Responses were analyzed manually, and then categorized and coded in preparation for data entry using the computer. Checks for completeness, errors and internal consistency continued during data processing. We used MS Excel to do data entry then exported it to SPSS for further analysis. The results were summarized and presented in frequency

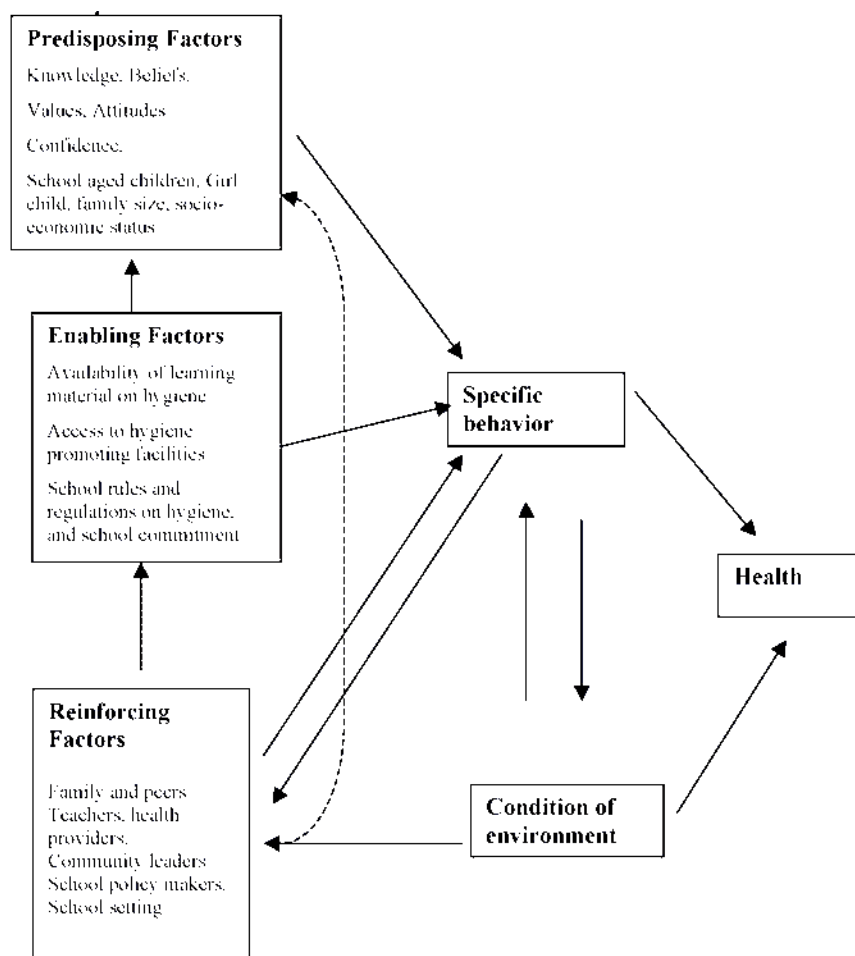


Figure 1. Adaptation of PRECEDE –PROCEED model of behavior determinants.¹¹

tables, graphs, cross tabulations and associations through chi-square tests to assess relationships in variables tested (Table 1).

Results

Hygiene behaviour

Hygienic practices were consistent across the four schools. Pupils did not utilize the toilet properly, urine was splashed all over the floor and the excreta were not properly disposed of. Girls did not dispose their sanitary pads into bins; instead they flushed them down the toilet which led to blockages. Two schools with hand washing facilities within the toilets had 60% of the pupils observed washing their hands. At those schools which had taps outside the toilets, 30% of pupils were observed washing their hands. In one school it was observed that pupils using the toilets were not putting on shoes nor washing their hands before consuming food.

Predisposing factors

A large percentage of children when asked if ever they had ever heard about cholera agreed that they had heard about cholera (97.8%) whilst 2.3% had never heard about the disease. On being asked to define cholera 145 (36.3%) said it was a disease only, 51 (12.8%) said it is a diarrhoeal disease, 134 (33.55%) just a disease and elaborated it with its causes and 70 (17.55%) gave a totally inappropriate response. Children who perceived not washing hands as a threat were confident to suggest how one could prevent cholera. The prevention strategies identified included: 7.5% (30) using Oral Rehydration Solution (ORS) 53.8% (215) seeking medical treatment 16.5% (46) practicing good hygiene compared to 13.5% (54) 54 (13.5%) who did not know.

Enabling factors findings

From the schools assessed there was piped water supply within the school although there was water rationing during school hours. Sanitary facilities were available in all the four schools.

Toilets were often not very clean and had an odour with some toilets blocked. Using the government standards¹ to calculate toilet adequacy, the toilets are not enough to serve the total number of pupils enrolled in the four schools sampled. Approximately one water closet was serving up to 36 pupils in each of the four schools. Girls on the other hand had no access to sanitary disposal bins within the school. Hand washing facilities were available in the schools; however, there was no cleansing agent (soap) in all the four schools. Learning materials were available although only in the

form of posters.

Discussion

Respondents were generally aware of cholera as seen by the 97.8% response to the awareness question. The knowledge score decreases as the questions require more information as 12.8% of the respondents are capable of elaborating on defining cholera as a diarrhoeal disease against 36.3% who defined it as a disease alone. However children's knowledge was strongly associated with what they learnt at school in the school curriculum. This is consistent with findings from Leeds by Kailenthaler *et al.*⁸

On cross tabulating to assess if predisposing factors were associated with sex there was no association ($P=0.646$). Respondents aged 12-13 years were more likely to have a higher knowledge score to those above or below this age. This could have been because those above this age could have had a learning disability. Respondents had a medical seeking attitude, which shows that they understand the concept of seeking medical treatment on infection.

Although schools have hygiene enabling facilities available, our findings indicated that there is under utilization of the facilities. There was a lack of supervision of toilets as they were poorly used and maintained by the school children. Moreover using government standards, these toilets were not adequate with the school enrolment, one water closet serving up to 36 pupils, which could have contributed to the blockages. Water rationing in schools is a limiting factor on the use and maintenance of the toilets resulting in poor use of the facilities by the children as toilets are often soiled and smelly. Mature girls in these schools remain challenged with access to safe sanitation as there is no provision of sanitary bins. This could have been the major cause of toilet blockages and the bad odour.

These findings compliment Moyo, Makoni and Ndamba¹⁰ who got similar results in Zimbabwe.

Learning materials were lacking in the schools and did not have sufficient resources to provide children with an enabling learning environment for hygiene promotion. Schools lacked a life skills training approach and teachers seemed to lack motivation in creating such an environment, thus failing to become role models or mentors for the school children.

The family plays a bigger role in life skills training on hygiene aspects of their children.⁸ In our study 50% of positive reinforcement came from the home compared to 27.3% who identified the school as a reinforcer. This reflects that the schools provide a theory based approach on hygiene issues which are relevant to the school curriculum but may lack the practical dimension of equipping children with everyday life skills.

On cross tabulating to assess relationships and associations on the responses, there was no association between reinforcing factors and sex ($P=0.988$). This shows that sex is an independent variable and doesn't affect children's responses on any of the factors assessed. Children's responses on hygiene promoting activities were highly associated with the school. This reflects that the schools curriculums were different probably in the implementation strategies used in each school for reinforcement ($P=0.005$).

Recommendations

There is need to strengthen the hygiene education programme to take an integrated approach in solving problems linked to school health problems such as access to safe sanitation for the girl child in the school and her special needs as she is maturing. This can be done through strengthening the school health promotion programmes. Further studies to trian-

Table 1. Summary of the demographic characteristics of the respondents in the study.

	Frequency (n=400)	Percentage
Name of school		
Budirirai	103	25.8
Chinembiri	86	21.5
Zengeza Main	104	26.0
St Marys	107	26.8
Sex of respondents		
Male	196	49.0
Female	204	51.0
Age of respondent		
10-11 years	40	10.0
12-13 years	325	81.3
14-15 years	33	8.3
16-17 years	2	0.5

gulate the factors leading to poor hygiene practices in schools and the impact of the disease burden largely due to poor water and sanitation related hygiene are also recommended.

Conclusions

Schools play an important role in equipping knowledge and life skill training relevant to water-and sanitation- related hygiene. However, in Chitungwiza schools, availability and accessibility of learning materials on hygiene and maintenance of the hygiene enabling facilities was associated with the children's predisposing factors i.e. knowledge and attitude on use and maintenance of the hygiene enabling facilities. This is because children lacked reinforcers and a life skills training approach in the school curriculum.

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